COMPREHENSIVE STUDY TO UNDERSTAND LONGITUDINAL ERW SEAM FAILURES

Submitted by, Battelle in collaboration with
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The objective of the proposed project is to assist the PHMSA in favorably closing NTSB Recommendation P-09-1 arising from the Carmichael MS pipeline rupture involving an ERW seam, which directed that the PHMSA conduct a comprehensive study of ERW pipe properties and the means to assure that they do not fail in service. The work is anticipated to validate that periodic use of the current ERW seam integrity assessment methods (hydrostatic testing and in-line inspection using a crack-detection tool) are the best means to prevent ERW seam ruptures. The work will address the characteristics of ERW seams that make them susceptible to failure, and it will identify the factors the pipeline operators must consider in order to assure that their ERW pipelines are safe.

In this quarter, the data was collected on operator's experience with in-line inspection of ERW pipelines. Thirteen cases of ERW seam integrity assessments described in this document involved three different types of in-line inspection (ILI) technologies:

- Ultrasonic angle-beam inspection for crack detection,
- Circumferential magnetic-flux leakage (CMFL) inspection
- Electromagnetic Acoustic Transducer (EMAT) inspection for crack detection.

The inspections covered 741 miles of liquid and natural gas pipelines comprised of low-frequency-welded ERW (LF-ERW) pipe, direct-current-welded ERW (DC-ERW) pipe, and/or high-frequency-welded ERW (HF-ERW) pipe. We have collected sufficient problem pedigree pipe and had it shipped to Battelle for cleaning and assessment. The challenge remains to test the samples in a timely fashion and get the program back on schedule.